truly represent the original compounds, the task becomes quite easy. It follows naturally from these assumptions that the acids determined in the mineral are found insufficient for the lime present; the existence of organic acids is therefore next assumed, and "organate of lime" appears in the author's analyses as an ingredient of mineral phosphates! R. W.

LIGHT SCIENCE

Anecdotal and Descriptive Natural History. By A. Romer.—*The Ivy.* A Monograph. By Shirley Hibberd.—*Buds and Blossoms.* Stories for Children. —*Fairy Mary's Dream.* By A. F. L. (Groombridge and Sons.)

It is very gratifying to see works of the above class brought out,—books which it is supposed, are calculated to amuse as well as instruct. Ten years ago they would have been a dead loss to the publisher, and their publication now is one of the surest proofs that science is permeating all classes and is appreciated by persons of all ages.

Mr. Romer's beautiful book explains in the introductory chapter in a clear and simple manner the classes and orders of the Animal Kingdom, and then goes on to describe the haunts and habits of the best known frequenters of the jungle and prairies, such as the lion, cheetah, and rhinoceros, giving particular attention to the monkey tribe and bears. The book is enlivened by numerous anecdotes and contains coloured plates and wood engravings.

"The Ivy" is a monograph comprising the history, uses, characteristics, and affinities of the plant, and a descriptive list of the garden ivies in cultivation. The book is most luxurious and tasteful, both in binding and letterpress. The plates, coloured with great delicacy, represent the various kinds of ivy, and so natural are the leaves, that one is almost tempted to take one up. A coloured sketch of the Entrance Gate of Conway Castle, surrounded by specimens of ivy, forms the title-page; the letterpress is thickly interspersed with sketches of "ivied castles, and churches, and quotations from Virgil, Euripides, Harleian Manuscripts, Shakespeare, Wordsworth, and the modern poets." An interesting part of the work is the author's historical and literary memoranda from the times when the ivy was called "the plant of Osiris" by the Egyptians down to the time when its praises were sung in that famous song, by Charles Dickens, "The Ivy Green."

"Buds and Blossoms," a book containing ten stories, will be a welcome addition to a child's library; the last, called the "Fir-tree's Story," being particularly pretty. This little volume contains several coloured plates and woodcuts, and the title-page is gracefully illuminated.

"Fairy Mary's Dream," another charming book for children, is in the form of a poem. The illustrations are well done. The colouring of the peacock's feathers on the title-page and in the plate "Till on a green fern's nodding crest" is exquisite; and besides the plates there are many engravings descriptive of the butterfly's journey.

W. L.

OUR BOOK SHELF

Pathologische Histologie der Luftwege und der Lunge. Von Dr. Albert Thierfelder. Atlas of six plates (Leipzig, 1872).

Although death and disease are as much a part of Nature as life and health, yet it is found convenient to separate the study of living structures under morbid conditions from the rest of biology, so that a work like the present must in these pages be more briefly noticed than its importance would deserve.

It is more than fifteen years since the publication of the late Prof. Förster's Atlas of Morbid Histology; and when we consider all that has been done in that time, represented in such volumes as those of Virchow, of Förster himself, of Rindfleisch, of Cornil and Ranvier, we see ample reason for the issue of a new series of plates illustrating the subject. The present *Heft* is the first instalment of the complete work, which is to consist of ten such, each complete in itself. The drawings are admirably executed both by Dr. Thierfelder and by the engraver. The text is strictly limited to explaining them, and is therefore much shorter than in Eiker's physiological atlas, for instance; but in the present state of pathology we regard this as a merit. The selection of subjects for illustration is always difficult: it might be objected that some of these drawings (*e.g.* fig. 2 of Pl. I.) represent little but normal tissues; but, on the whole, practical pathologists will not have room to complain on this score. Some patriotic anatomists will be glad to see "die von den Engländern supposirte Basementmembrane" taking its place without question here. The price of these beautiful plates is very moderate, and we heartily wish Dr. Thierfelder success in completing his work.

Coalfields, Western Port. Report of the Board to the Colonial Government, Victoria.

The Government of Victoria are determined to find a workable coal-field in that colony, and, apparently not satisfied with the examination of the mesozoic rocks made by the extinct Geological Survey, have had the same strata re-examined by a mining engineer acting under the direction of a Board. The results of these further investigations are embodied in this final Report, but they add little or nothing to our previous knowledge. Indeed the Report seems to be for the most part a work of supererogation. The geological age of the coal-bearing strata had already been definitely ascertained by Mr. Selwyn and his staff, yet the Report goes into this question at considerable length as if it was quite a novelty. Then, as regards the extent of the actually proved coal-seams, Mr. Selwyn, as is well known, expressed an unfavourable opinion. Upon his geological map of Cape Patterson the coal-seams exposed upon the coast are protracted inland so as to show the approximate area over which they extend, and this is only some 106 acres. So experienced a geologist as Mr. Selwyn was not likely to misread the evidence which is so clearly and abundantly developed along the coast. But the Board believe that "any calculations based on the bearings of the strike of seams in this locality are unreliable." There does not appear, however, to be anything specially mysterious and abnormal about the coal-bearing strata of Cape Patterson, nor is there any reason why they should not "behave" like similar deposits elsewhere. The Geological Survey's map shows a very small area of workable coal, and perhaps this is why the strike and dip on the well-exposed coast at Cape Patterson are considered unreliable—the wish in this case being father to the thought. Mr. Selwyn and Professor M'Coy both believed it possible that at some considerable depth below the coal-seams of Cape Patterson a better coal-field might be got. The Board, however, does not think this likely. Here, again, we should be inclined to pay more deference to the opinion

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of highly trained and experienced geologists than to that of gentlemen, who, whatever their attainments may be, certainly do not in this Report evince much acquaintance with geology. J. G.

Reports of the Mining Surveyors and Registrars for Quarter ending March 31, 1872. Victoria.

THERE is nothing in these Reports calling for special notice. The total quantity of gold got respectively from alluvia (or, as the Reports have it, *alluviums*) and quartz reefs during the quarter were as follows:—Alluvial, 171,851 oz. 10 dwt.; quartz, 164,670 oz. 8 dwt.; total, 336,521 oz. 18 dwt. The quantity of gold, the produce of the colony, exported during the same period was 398,131 oz. 10 dwt.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

Aurora Spectrum

IN connection with my letter in last number of NATURE, I have in a diagram approximately placed the aurora lines side by side with the spectrum of hydrogen and of some of the principal air lines (as given in Dr. Watt's index) and with the following results:—

Line No. 1. Close upon, if not identical with, an air-line marked by Huggins N O, and Plücher O.

No. 2.—Not apparently coincident with any prominent air-line. The coincidence with a line of oxygen noted by so careful an observer as Mr. Proctor is puzzling; and if the instrumental power used was sufficient to ensure absolute identity, seems to indicate a second or unusual spectrum of that gas.

No. 3 is not near any principal air-line.

No. 4 is nearly coincident with a faint line of oxygen (confirmatory of Mr. Proctor's observations).

No. 5 corresponds to a rather strong N line.

No. 6 does not coincide with any principal air-line, very faint lines of O and N being the nearest.

No. 7. Upon close examination the positions of this line as respectively fixed by Mr. Proctor and Lord Lindsay are not inconsistent, and the line closely corresponds with a strong line of oxygen situate on the less refrangible side of solar G.

Nos. 1, 4, 6, and 7 fairly correspond in intensity with their representative air-lines. None of the lines are identified with $H\alpha$, $H\beta$, or $H\gamma$, and it would appear that the aurora, if a spectra of atmospheric gases, mainly selects oxygen and ignores $H\alpha$ and the stronger N lines. The modification of compound spectra by conditions of temperature and pressure, is however only a partially explored subject, and we have moreover no certain data of conditions in the case of the aurora, which will assist us in bringing it to bear.

I accidentally omitted from the names of some observers of the zodiacal light that of Prof. Piazzi Smyth, whose observations in the south may be said to have conclusively demolished the supposed identity of the light, and the aurora (at least so far as bright lines are concerned) made it extremely improbable that anything beyond a continuous spectrum will ever be seen in the pure zodiacal light, though a further search should be by no means neglected. J. RAND CAPRON

Guildford, Jan. 10, 1873

Polarisation of the Zodiacal Light and of the Aurora

IN the interesting article by Mr. Rand Capron in the last number of NATURE—after collating the various results of the spectroscopic examinations of the aurora and zodiacal light which have appeared at different times in your pages, together with those which have been collected by Dr. Schellen—he terminates his analysis of the general results by remarking that he is "not aware whether the zodiacal light and the aurora have been examined with the polariscope," and suggests that the "light, though faint, might be tested with a Nicol's prism and Savart's bands."

I would refer him to a paper in the March number of the "Monthly Notices of the Astronomical Society" for 1871, in which an observation by Mr. Burton (late assistant to the Earl of Rosse) on the polarisation of the zodiacal light is described.

Mr. Burton was one of the eclipse party stationed at Agosta, in Sicily. He made use of a Savart's polariscope, set so as to give a black centre where the bands were parallel to the plane of polarisation. On looking to the brightest parts of the zodiacal light Mr. Burton believed that he could detect faint traces of polarisation, sufficiently strong to enable him just to recognise that the bands were black centred when their direction coincided with the axis of the cone of light, that is, when the direction passed through the position of the sun.

To make sure that he was not examining the remains of air polarisation given by the slight remaining twilight, he examined the light of other parts of the heavens, but was unable anywhere else to detect any trace of bands. In contradistinction, however, to this must be set an observation of my own, yielding a negative result, though made on the same evening and with a similar instrument, as well as with the same Savart used by Mr. Burton. I was, however, unable to detect any trace of bands either upon the cones of zodiacal brightness or upon the adjacent parts of the sky; but it is very possible that Mr. Burton's eye may be more sensitive to faint lights than my own.

In February last I also met with a negative result in examining a faint trace of the zodiacal light visible in England. I then used a double-image prism as well as a Savart, thinking that its two oppositely polarised fields in juxtaposition might afford a more delicate test for so faint an object.

Capt. Tupman while cruising in the Mediterranean has also, I believe, repeatedly obtained negative results when making use of a Savart on the zodiacal light.

And I understand that Mr. Lockyer, together with the other observers of the Indian Eclipse of December 1871, totally failed to detect any traces of polarisation in the brilliant displays of the zodiacal light which they observed while crossing the Indian Ocean.

I am therefore disposed to conclude that any traces of polarisation must be very slight, if indeed any polarisation at all is to be attributed to the zodiacal light itself and not to the veil of atmospheric impurities lying between us and objects near to the horizon. Certainly we may conclude that there is no such polarisation as is found in the light of the solar corona or—as we might expect—if the zodiacal light were caused by a great cloud of cosmical dust made up of particles smaller in diameter than the wave-length.

Indeed there cannot be as great a percentage of polarisation, or, to speak more exactly, as great a difference between the component radial to the sun's place and the component at right angles, as in the case of a sunbeam dispersed by the dust in our own atmosphere. For if any one will examine the track of a sunbeam passing through a room with a Savart, he will not fail to be struck with the distinctness of the bands. We seem therefore justified in concluding, that if the zodiacal light is composed of cosmical dust, such dust particles must be considerably coarser than those which float in our own atmosphere.

As to the polarisation of the light of the aurora, I examined, both with a double-image prism and Savart, a faint auroral display on November 10, 1871; as also the light of the great aurora of Sunday, Feb. 4, 1872, but in neither instance was able to detect any traces of polarisation.

A. COWPER RANYARD

The Diathermacy of Flame

THERE are some statements in Capt. Ericsson's reply to my letter (NATURE, vol. vii. p. 149) which demand discussion. In the first place he calculates the supply of gas in *his* pipe and applies it to *my* burners. As his pipe did not supply my flames, but his own, which were at least fifteen times larger than mine, the applicability of his figures is rather obscure.

Capt. Ericsson says, "The apparatus contrived by Mr. Williams for determining the diathermancy of flame, as described by himself, is exceedingly faulty, *the temperature it records being that produced by heat derived from several sources. The radiant heat transmitted to the bulb of the thermometer by the flames, acting conjointly with the unknown degree of heat imparted by the surrounding medium*, it will be evident that Mr. Williams' device is worthless as an indicator of radiant intensity." Does Capt. Ericsson really mean that the maximum temperature indicated by a thermometer exposed to several varying sources of heat is not determined by the maximum radiators or convections

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